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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/510,604 | 10/08/2004 | Spencer Edwin Taylor | 608-442 | 4020 |

23117 7590 06/14/2007
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| EXAMINER |
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SINGH, PREM C

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| ART UNIT | PAPER NUMBER |
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1764

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| MAIL DATE | DELIVERY MODE |
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06/14/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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|------------------------------|-------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 10/510,604 | Applicant(s) TAYLOR, SPENCER EDWIN | |
| | Examiner Prem C. Singh | Art Unit 1764 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 47, 48, 51-63, 66-72 and 75-77 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 47, 48, 51-57, 60-63, 66-72 and 75-77 is/are rejected.
- 7) ☒ Claim(s) 58 and 59 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>11/21/2006</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

New abstract and title is noted.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 47, 48, 51-57, 60, and 77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fenske et al (US Patent 2,139,943).

Claim 47.

Fenske invention discloses a process of extraction from crude petroleum or products thereof of materials considered deleterious, by the simultaneous use of a selective solvent and an adsorbent material. The invention discloses, "The substances to be removed depend generally upon the source of the crude and/or the character of the prior treatment thereof. These materials include nitrogen compounds." (Page 1, column 1, lines 9-16). Fenske invention also discloses, "Other solvents which are selective as to type of molecule are benzaldehyde, propionaldehyde, tolualdehyde, etc." (Page 3, column 2, lines 65-75; page 4, column 1, lines 1-2). Fenske further discloses, "Sharper separation between desired and undesired constituents may be obtained by extracting the oil with a suitable solvent in the presence of an adsorbent material, or, in other words, by extracting in presence of a filter medium." Fenske also adds, "Many solvents which are selective as to type of molecule and therefore, suitable for maintaining the adsorbent medium substantially revived." (Page 3, column 2, lines 57-60). Thus, since the separation is better when benzaldehyde and the adsorbent act together, it would have been obvious to one skilled in the art at the time the invention was made to modify Fenske invention and use benzaldehyde functionality supported on the adsorbent support for effective removal of nitrogen compounds from distillates.

It is to be noted that Fenske does not specifically mention about jet fuel, N-H containing heterocyclic aromatic compound, and active concentration of metal compounds in the fuel or exposure of the fuel to active metals during use or storage.

Fenske invention does mention about petroleum fraction which includes jet fuel. The invention also discloses removal of nitrogen compounds, which includes N-H compounds. Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify Fenske invention and use a jet fuel for the removal of N-H compound in a process to produce a jet fuel with improved properties.

It is also known to those skilled in the art that distillate fuel after removal of nitrogen compounds will be stored in storage vessels before use and will be passed through tubes/pipes during the use. The storage vessels and tubes/pipes are mostly metallic.

Although Fenske does not explicitly disclose benzaldehyde functionality supported on the adsorbent support, it would have been obvious to one skilled in the art at the time the invention was made to modify Fenske invention and use benzaldehyde functionality supported on the adsorbent for removal of nitrogen compounds from distillates because the separation is better when benzaldehyde and the adsorbent act together.

Claim 48.

Although Fenske invention does not specifically mention about a jet fuel containing an active concentration of metal compounds, the invention does disclose using a petroleum distillate. Fenske further adds, "These materials include asphaltic substances, resins, nitrogen compounds, sulfur compounds, unsaturates, naphthenic acids, color bodies, etc." (Page 1, column 1, lines 12-16). Since the distillates comprise

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of jet fuel, it is expected that jet fuel will inherently have all the impurities, including metal compounds.

Claims 51-54, 60, and 77.

Fenske invention does not specifically mention about different compounds, but does mention using benzaldehyde as discussed under claim 47, thus, it would have been obvious to one skilled in the art at the time the invention was made to modify Fenske invention and use claimed compounds with benzaldehyde functionality, because all the compounds are functionally similar and expected to give effective removal of nitrogen compounds from distillates.

Claim 55.

Fenske invention discloses, "The other method involves filtration through a suitable adsorbent material such as fuller's earth, silica gel, bauxite, activated charcoal, Florida earth etc." (Page 1, column 1, lines 21-24).

Claims 56, 57.

Fenske invention does not specifically mention about kaolinite clay, but since this clay is chemically a mixture of silicates and aluminum oxide/hydroxides, it should functionally work similar to the adsorbents discussed under claims 49 and 55. Thus it would have been obvious to one skilled in the art at the time the invention was made to

modify Fenske invention and use kaolinite clay because it is expected to be equally effective for nitrogen removal from distillates.

Claims 61-63, and 66-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fenske et al (US Patent 2,139,943) in view of Jewell et al (US Patent 3,446,729).

Claims 61-63 and 66-70 are rejected under 35 USC 103(a) as being unpatentable over Fenske et al (US Patent 2,139,943) in view of Jewell et al (US Patent 3,446,729).

Claims 61-63 and 66-70.

Fenske invention does not specifically disclose nitrogen compounds.

Jewell discloses a process for removing sulfur, oxygen, and nitrogen compounds from petroleum distillates. Jewell invention discloses, "Among the nitrogen compounds generally resistive to standard refinery procedures are carbazoles." (Column 3, lines 24-26). Jewell also discloses indole as another heterocyclic nitrogen compound (Column 6, line 61).

Since Fenske and Jewell inventions are disclosing processes for removing nitrogen, sulfur, and oxygen compounds from petroleum distillates using adsorbents, it would have been obvious to one skilled in the art at the time the invention was made to modify Fenske invention and remove carbazoles and indoles from petroleum distillates

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as disclosed by Jewell invention. Also, since carbazoles and indoles are heterocyclic aromatic nitrogen compounds, any derivatives of carbazoles and indoles will act in similar fashion and can be removed from distillates by Fenske process.

Claims 71, 72, 75, and 76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fenske et al (US Patent 2,139,943) in view of Johnson et al (US Patent 4,409,092).

Claims 71, 72, 75, and 76.

Fenske invention does not specifically disclose metals in the jet fuel.

Johnson discloses a process for producing jet fuels from hydrocarbon materials derived from oil shale, coal and crude oil. The invention discloses, "Oil feed materials from crude oils coal and shale oil boiling up to 1000°F or 1050°F and containing a considerable amount of sediment fines, metal contaminant materials such as iron, copper, nickel, vanadium, sulfides thereof and other materials which would tend to plug a catalyst bed, and arsenic which is a poison for hydrotreating and reforming catalysts and other catalysts used in the process. These metal contaminants are first at least partially removed from the oil feedstock by passing through a bed of adsorbent material." (Column 4, lines 57-67). "Any solid sorbent material may be used for this purpose including spent cracking catalyst, clays, and other inert materials suitable for the purpose." (Column 7, lines 23-26).

Since Fenske and Johnson inventions disclose production of jet fuel using similar feeds, processing with an adsorbent, and operating conditions, it would have been obvious to one skilled in the art at the time the invention was made to modify Fenske invention and remove the metals from the jet fuel processing as disclosed by Johnson.

Allowable Subject Matter

Claims 58 and 59 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

A method for improving the thermal stability of a jet fuel as claimed in claim 47, wherein the benzaldehyde functionality is adsorbed on a suitable support to a level as claimed, is not taught or fairly suggested in the prior art.

Response to Arguments

The Applicant argues that Fenske fails to disclose or suggest at least: jet fuel, N-H containing heterocyclic aromatic compounds, active concentration of metal compounds, and an adsorbent comprising a compound having a benzaldehyde functionality supported on a suitable support. Absent any suggestion of the combination

of features now claimed, Fenske fails to give rise to a prima facie case of obviousness. Any assertion that Fenske suggests the invention as now claimed necessarily involves the application of hindsight, which is clearly not permitted.

The Applicant's argument is not persuasive because Fenske discloses petroleum fractions, which includes jet fuel (See page 1, column 1, lines 7-10). Fenske discloses removal of nitrogen compounds, which includes N-H containing heterocyclic aromatic compounds, which is also evidenced by Jewell (See Jewell, column 1, lines 41-45; column 3, lines 24-26). It is known to those skilled in the art that the treated jet fuel will be exposed to metal compounds during storage or use, because any storage vessel or process lines/fittings are all made of metals. Fenske also discloses the necessity of passing the petroleum fraction through the adsorbent in presence of benzaldehyde (See Office action above).

With regard to claims 49 and 50 (now cancelled, and incorporated into claim 47) the Applicant argues that such a selection is not justified on the basis of the document as a whole, especially since (as Fenske explains) the support and the solvent are performing independent functions (see page 3, column 2, lines 21 to 39). Thus, the adsorbent and solvent pick up materials to different extents. For these reasons at least, Fenske does not suggest the present invention.

The Applicant's argument is not persuasive because Fenske uses an adsorbent in presence of a solvent (for example, benzaldehyde) and mentions that separation is better when benzaldehyde and the adsorbent both are present. Thus, one skilled in the

art will treat the petroleum fraction (jet fuel) with the adsorbent having benzaldehyde functionality.

With respect to claims 61 to 70, the Applicant argues that Jewell relates to a refinery process in which basic nitrogen compounds are extracted with phosphoric acid (see, claim 1, step (d)). This is completely unrelated to Fenske and is also unrelated to the presently claimed invention.

The Applicant's argument is not persuasive because Jewell reference has been used only as an evidence that nitrogen impurities disclosed by Fenske comprise heterocyclic nitrogen compounds such as carbazoles and indoles.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

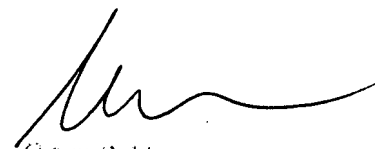
the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prem C. Singh whose telephone number is 571-272-6381. The examiner can normally be reached on MF 7:00 AM-3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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